



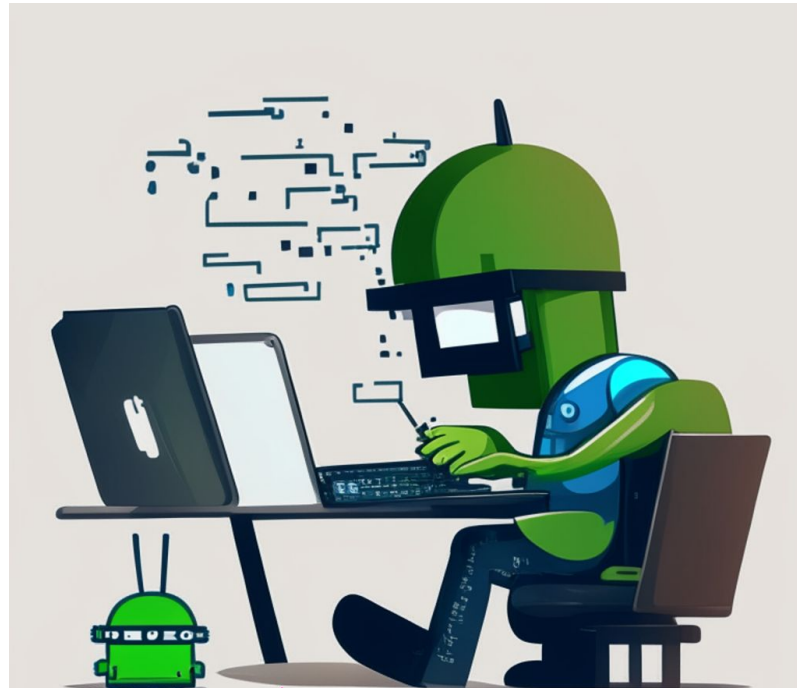
Arm Solutions at Lightspeed

The Devboards Community for Android

Amit Pundir, Linaro

About Me!

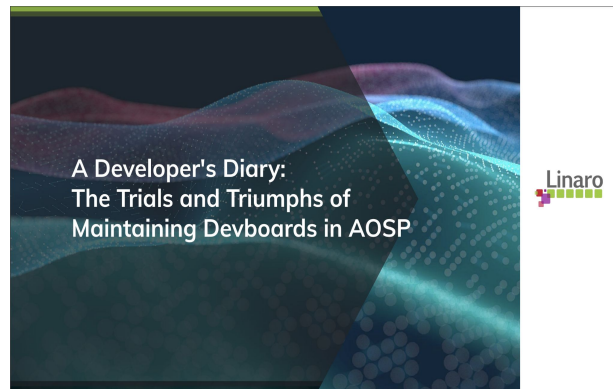
- Senior Engineer at Linaro
- 10+ years of **AOSP** (Android Open Source Project) bringup and maintenance
- pundir on [#aosp-developers](#), [#linaro-android](#) IRC channels at OFTC.net



Flashback: Linaro, Development Boards and AOSP!

Linaro has been a long-time advocate of development boards in AOSP

- Linaro Android team support AOSP on a variety of member devboards, and perform extensive testing coverage
- We have been talking about the importance of devboards in AOSP for years now
 - Last year at EOSS, Prague, we talked about The pain-points and benefits of maintaining Devboards in AOSP and keeping up with the AOSP on devboards



[EOSS, Prague '23: Maintaining Devboards in AOSP, Linaro](#)

Agenda!

The Devboards Community for AOSP!



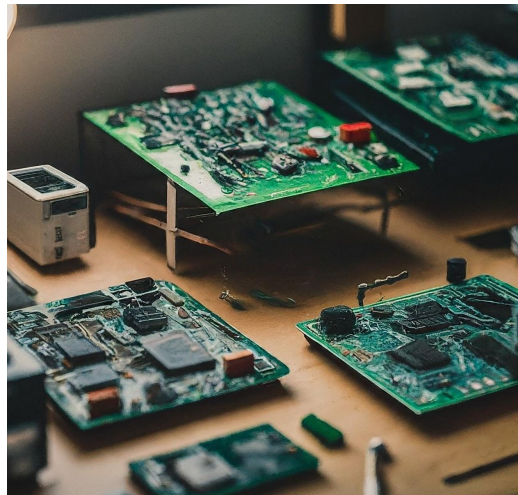
Decoding the Age-Old Mystery!

- "Which device prototype or a development board do you suggest for my XYZ project?"
 - Got to be one of the most frequently asked question in the embedded world.
- Embedded Android is no different and we run into similar questions around Android development boards all the time.
 - "What devices support AOSP reliably, and to what extent?"

In Embedded, One Size Doesn't Fit All!

Devboards for an Embedded Android project can be chosen based on a number of factors

- Project requirements
- Popularity and Availability of the device
- Upstream support
- Active Community and Documentation
- Vendor support



Android Devboards: A Treasure Hunt for Developers!



Android Reference Boards!

- Android reference boards are the obvious choice that drive most of the Android devboard usage
 - <https://source.android.com/docs/setup/create/devices>
- A very limited set of devboards in AOSP. Mostly used as reference for developing and testing upcoming AOSP feature
 - If your project requirements align with any of these reference boards, then look no further than that

AOSP > Docs > Getting Started

Was this helpful?

Use reference boards

Android Open Source Project (AOSP) builds are mostly useful for emulators, but you can also create builds for Google's Nexus and Pixel devices using AOSP builds and the relevant device-specific binaries. For the list of available builds and targeted devices, see [Source code tags](#) and [builds](#).

There are also many SoC reference boards that can run AOSP-based builds. These can help nonmobile component vendors develop and port drivers to Android releases. Using a reference board can ease upgrade efforts, reduce time to market for new Android devices, lower device costs by enabling ODM/OEMs to choose from a wider range of compatible components, and increase the speed of innovation among component suppliers.

The boards listed here are not supported and tested in AOSP. The Board Support Package (BSP) for a reference board may be obtained from the board manufacturer directly.

DragonBoard 845c

The DragonBoard 845c is part of the RB3 platform and is available from 96boards.org.

The [db845c AOSP wiki](#) provides supporting documentation for AOSP builds on this board.

Qualcomm Robotics Board RB5

The Robotics Board RB5 is available from 96boards.org.

The [RB5 AOSP wiki](#) provides supporting documentation for AOSP builds on this board.

Khadas VIM3

The VIM3 SBC is available from [Khadas](#).

The [VIM3 AOSP wiki](#) provides supporting documentation for AOSP builds on this board.

On this page

[DragonBoard 845c](#)

[Qualcomm Robotics Board RB5](#)

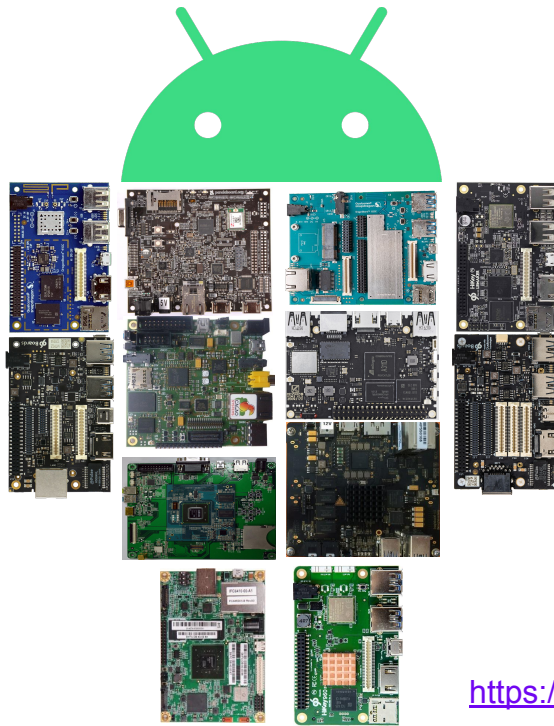
[Khadas VIM3](#)

Community Supported Reference Devices

There are a few projects that provide reliable AOSP support on their respective device outside of the official Android reference boards

- Baylibre
 - Amlogic VIM3, TI AM6x, MTK devices
- Github: GlodroidCommunity
 - Raspberry PI 4, Pine64-PinePhone, Qualcomm MSM89xx, Amlogic, Rockchip devices
- Github: android-rpi
 - Raspberry PI 5
- Github: SoMainline
 - Sony phones running mainline-kernel
- Github: AOSPM
 - Qualcomm SDM845 phones: OnePlus 6, PocoF1, SHIFT6mq
-

Project DevboardsForAndroid!



<https://devboardsforandroid.linaro.org/>

Flashback: AndroidMC @ LPC 2021..



LPC '21: Improving AOSP Devboard Collaboration, Linaro

AOSP Developers Community



Community overview webpage

[View My GitHub Profile](#)

About

Welcome to the AOSP Developers Community!

This website is a common hub for developers with a shared interest in reducing code duplication in AOSP device HALs. Often we find that a lot of devices contain very similar code, with minimal changes to support device specific features.

We'd like to shift the focus of AOSP HAL development towards writing code which can benefit the whole community, by focusing on upstream Linux APIs and generic interfaces.

Blog Updates

Check out recent happening in the community!

Join in!

This is a community project, so if you're working on AOSP for a upstream focused board or device we'd love to hear about it! You can come chat with us on IRC or matrix (see links below), simply open a pull request to add your project to the links below and we'd be happy to include it!

Come chat with us

We have an IRC channel `#aosp-developers` @ OFTC.net

You can also join via matrix using a client like `element.io`, simply click this link or join `#_oftc_aosp-developers:matrix.org`.

Community Projects

Just so we can find each others work, here are links to various independent AOSP focused efforts going on in the community.

GloDroid - AOSP environment utilizing upstream kernel for OrangePi, PinePhone and RaspberryPi devices

Generic sdm845 device project - AOSP device directory to support a variety of sdm845 based devices (OnePlus6, Pocof1, etc)

AOSP devboards - Upstream AOSP supports a few devboards maintained collaboratively between Google, Linaro and Baylibre

Generic HAL Efforts

Force Feedback haptics hal - A generic haptics HAL which supports drivers using the force feedback API via input class devices.

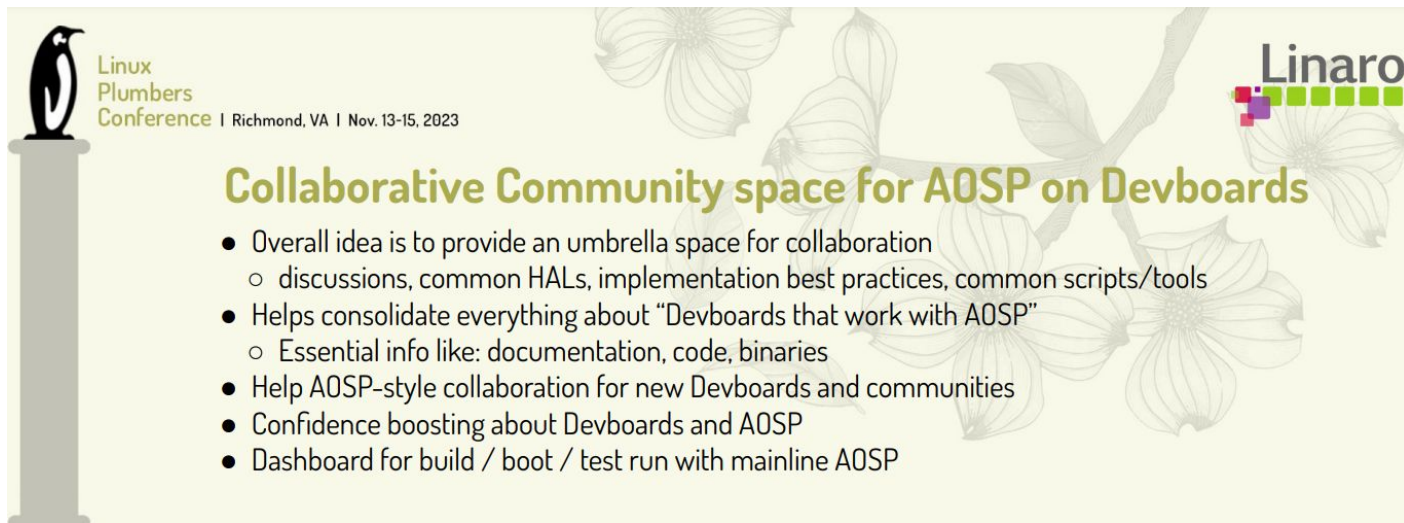
drm_hwcomposer - DRM/KMS based HWComposer implementation used on many devices

tinyhal - Generic Audio HAL on top of tinysalsa and tinycompress. Configured via XML.

Hosted on GitHub Pages — Theme by orderedlist

Community Interaction and Feedback!

Introduced the project at [Android MC](#) @ Linux Plumbers Conference 2023



The slide features a light green background with a faint floral pattern. On the left, there is a penguin logo on a pedestal. The top left corner contains the text 'Linux Plumbers Conference | Richmond, VA | Nov. 13-15, 2023'. The top right corner features the Linaro logo. The main title is 'Collaborative Community space for AOSP on Devboards'. Below the title is a bulleted list of points.

Linux Plumbers Conference | Richmond, VA | Nov. 13-15, 2023

Collaborative Community space for AOSP on Devboards

- Overall idea is to provide an umbrella space for collaboration
 - discussions, common HALs, implementation best practices, common scripts/tools
- Helps consolidate everything about "Devboards that work with AOSP"
 - Essential info like: documentation, code, binaries
- Help AOSP-style collaboration for new Devboards and communities
- Confidence boosting about Devboards and AOSP
- Dashboard for build / boot / test run with mainline AOSP

Project Goals!

We hope to enable this project as an umbrella space for collaboration of AOSP system developers

- Consolidation of resources about the devices that work with AOSP
 - Providing a wider range of devices to folks doing prototype work on AOSP
 - Providing staging area for the AOSP devices under development
- Enabling a community of AOSP system developers
 - Sharing bring-up experiences and troubleshooting ideas
 - Co-developing AOSP features like generic HALs across multiple devices

Key Features!

- The list of devices known to support AOSP reliably
 - Device information and link to device resources like kernel source, local manifest, device config, binary blobs, documentation, recovery tools et al

Contents

- Introduction
 - Goals
 - Software Components
 - Community Maintainer(s)
- Devices Supported
 - Hikey960
 - Device Maintainer(s)
 - RB5
 - Getting started with RB5
 - Install pre-built AOSP images on RB5
 - Compile AOSP from sources for RB5
 - Building the kernel for RB5
 - ToDo / Known Issues
 - RB3
 - Getting started with RB3 (also known as DB845c)
 - Install pre-built AOSP images on RB3
 - Compile AOSP from sources for RB3
 - Building the kernel for RB3
 - Booting AOSP from MMC Sdcard
 - VIM3
 - Board status
 - Device Maintainer(s)
 - SM8550-HDK
 - Getting started with SM8550-HDK
 - Compile AOSP from sources for SM8x50 (Snapdragon 8 Gen) devices
 - Flashing and booting AOSP from mmc-sdcard
 - Building and booting with custom kernel
 - Known issues and Troubleshooting on sm8550-hdk
- Contributing
 - Requirements for adding Devboards
 - Interactions
 - Google Groups

Key Features!

- AOSP-style collaboration
 - Gerrit based review setup and source navigation
- Reference projects
 - local_manifests, reference HALs, reference build target
 - Development tools like vendor-package, website (readthedocs)
 - Upstream project forks during development stage
- Staging area for upstream focussed devices
 - Facilitate development of AOSP relevant devices like SM8550-HDK, E850-96

Upcoming Changes!

- There are some concerns about hosting this community project on linaro.org domain.
- We may likely move the landing page of this community “Devboards for AOSP” project under Github’s [AOSP Developers Community](https://github.com/AOSP-Developers-Community) project
 - May include moving the supported device information and probably local_manifest under the Github project

AOSP Developers Community



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Call For Participation!

- Let's work together to improve the community around AOSP devices
- Get involved. Join the conversation at [#aosp-developers](#) IRC channel @OFTC.net



Questions, Concerns, Feedback?

Thank You!

Visit linaro.org